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ABSTRACT

Research has shown that perceived stress with a supervisor affects the way in which intellectual abilities, experience, and task knowledge contribute to leadership performance. Stress with subordinates, as well as superiors, may affect the utilization of intelligence and experience in leadership tasks. Questionnaires measuring intelligence, experience, and interpersonal stress were completed by 136 fire department officers and performance evaluations were collected from each officer's immediate superior. Results indicated that lower level leaders' experience in the organization was critical in determining their performance under high stress, while higher level leaders' intelligence was the critical factor in their performance under stress. The moderating effects of stress were significant for interactions moderated by supervisor stress and by subordinate stress. The findings suggest that interpersonal stress with co-workers, not just stress with superiors, moderates experience and intelligence utilization. (Author/NRB)

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Interpersonal Stress as a Moderator of Experience and Intelligence Utilization

Industrial/Organizational

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PRESENTATION SUMMARY

Recent studies have shown that perceived stress with the boss affects the way in which intellectual abilities, experience, and task knowledge contribute to leadership performance (Fiedler and Leister, 1977; Fiedler, Potter, Zais, and Knowlton, 1979; Potter and Fiedler, 1980). This study investigates how stress with subordinates, as well as superiors, affects the utilization of intelligence and experience in leadership tasks.

A study reported by Fiedler, Potter, Zais, and Knowlton (1979) considered the correlations between intelligence and experience with leader performance in the context of a third, or moderating variable. Four studies were conducted to compare the correlation of either intelligence or experience with the leader's rated performance, separately for those leaders reporting stress with the superior (Boss Stress) above the median and below the median. Only when stress with the boss was below the median did performance correlate positively with intelligence. No correlation was found between experience and performance when stress was below the median. When Boss Stress was above the median, experience correlated positively with performance but intelligence did not. Their conclusion was that "stress in the relationship between individuals in line or staff positions and their superiors strongly moderates the correlations."

Interpersonal stress can be defined as a social perception that the leader makes about co-worker interactions (Kahn, Wolfe, Quinn and Snoek, 1964). The stress is a result of conflicting or

ambiguous demands co-workers make of the leader. Previous studies have often examined only stress induced by the immediate superior (e.g., Fiedler et al, 1979). It is important to note that in each of these studies the performance evaluation was completed by the immediate superior, who was also the source of the perceived stress. Stress with other co-workers who are not evaluators (e.g., subordinates) would not confound the source of the stress with the evaluation of performance. Moreover, it is important theoretically if stress with subordinates has the same moderating effects that Boss Stress has been shown to have. If stress adds to the complexity of the leader's task, then an increase in stress from one source must moderate performance in much the same way as stress from a different interpersonal source.

This study tests the hypothesis that the contribution of experience and intelligence to performance will be moderated by stress, whether stress is defined as induced by subordinates or by the boss. When Boss Stress effects are significant, Subordinate Stress effects will be significant as well.

This hypothesis was tested in a sample of 136 fire department officers. The duties and responsibilities of leaders in this sample are comparable to those in the previously summarized studies (e.g., Fiedler and Potter, 1980). Since fire department officers can hold either the rank of lieutenant or captain, and the duties for each rank differ, the two will be treated as different leadership positions and data for each analyzed separately. Data were collected from the officers by questionnaire and all officers

voluntarily agreed to participate. Performance evaluations were collected from each officer's immediate superior, the battalion chief.

Tests and Measures

Intelligence was assessed by the Wonderlic Personnel Test (1977). This test measures verbal and quantitative abilities (Guion, 1965) and has been used for selection purposes across many types of organizational positions. Mean score for captains was 27.25 and for lieutenants was 27.43, a nonsignificant difference. These means correspond roughly to a score on the Wechsler Adult Intelligence Scale (WAIS) of 110.5 (Wechsler, 1958).

Experience of the officers was measured by Time in Service (TIS), which is the number of months the officer has been in the fire service. The mean for captains was 211.59 and the mean for lieutenants was 182.78. The captains had significantly more Time in Service than did the lieutenants ($t=2.1869$, $p<.05$).

Interpersonal Stress was measured by a 17 item scale describing the amount of stress the officer felt as a result of co-workers behaving in various, specific ways. Items on the scale were adapted from Stodgill's (1963) LBDQ XII scale. The officers were asked to respond to each item on a seven point Likert type response scale ("1"=the behavior causes no stress, "7"=the behavior causes extreme stress). A Principle Components Analysis of these items resulted in two factors which accounted for a total of 64% of the scale's total variance.

The first factor described stress induced by the immediate

superior of the respondent. Items loading highly on this factor describe the superior as restricting the officer's influence or limiting the communication of relevant information to the officer. The second factor, labeled Subordinate Stress, described stress induced by quarrelsome and unreliable subordinates.

Dependent variable - Performance was measured by an evaluation scale specifically constructed for this study. A Behavior Observation Scale (Latham, Fay, and Saari, 1979) was designed using critical incidents collected from each officer's superior. In this format each scale item describes one specific and observable behavior judged as important to the officer's duties. The evaluator is then asked to report the frequency the ratee has performed that behavior in the recent past. A five point Likert type response scale was used ("1"=Almost never performs the behavior, "5"=Almost always performs the described behavior).

The final evaluation form contained 39 items and had a split-half reliability of .94, which indicated that it is a unidimensional measure of company officer performance. Item scores were standardized by rater to control for rater biases and responses for all items then summed. The resulting score is then an evaluation of the officer's total performance as a leader by the immediate supervisor. The mean score for the 32 captains in this study ($\bar{X}$=.2205) was significantly higher than that for the 51 lieutenants ($\bar{X}$=-.1013; $t=2.9844$, $p<.01$).

Results

Variables were entered into a stepwise multiple regression analysis for captains and lieutenants separately. Main effects for each variable (i.e., Intelligence, Experience, Boss Stress, and Subordinate Stress) were entered in a single step prior to testing any interaction terms. Four interaction terms were entered in the next step; Intelligence x Boss Stress, Intelligence x Subordinate Stress, Experience x Boss Stress, and Experience x Subordinate Stress.

For lieutenants, two of the four interactions tested contributed significant amounts to the explained variance, beyond what the simple main effects had explained. The interaction Experience x Boss Stress explained 8.2% of the variance in lieutenants' rated performance. The interaction Experience x Subordinate Stress explained 5.5% of the variance in lieutenants' leadership performance evaluations. For lieutenants, neither Boss Stress nor Subordinate Stress was a significant moderator of Intelligence utilization.

Figure 1 depicts graphically the interaction between Boss Stress and Experience for lieutenants. The lieutenants are split at the median on Experience, and are also split at the median on reported Boss Stress. Among those lieutenants reporting high stress with their boss, more experienced lieutenants clearly have a higher mean performance evaluation. This result replicates earlier studies (e.g., Fiedler et al, 1979) of Boss Stress effects.

Figure 2 shows a similar graph for the Subordinate Stress and Experience interaction. When lieutenants report high stress with

their subordinates, those who have greater experience have a higher mean performance rating. This result is quite similar to that shown in Figure 1, for Boss Stress, and supports the hypothesis that Boss and Subordinate Stresses have similar, significant effects on experience utilization.

For captains, two of the four interactions tested contributed significant amounts to the explained variance, beyond what the simple main effects had explained. The interaction Intelligence x Boss Stress explained 4.6% of the variance in captains' rated performance. The interaction Intelligence x Subordinate Stress contributed 26.7% to the explained variance among captains. For captains, neither Boss Stress nor Subordinate Stress was a significant moderator of Experience utilization.

The Intelligence x Boss Stress interaction is shown in Figure 3. When Boss Stress is below the median captains with higher intelligence test scores have a higher mean performance level. This result partially replicates Fiedler et al's (1979) findings in that only when low Boss Stress was reported did intelligence have a positive relation to performance. However, Figure 3 also reveals that when Boss Stress is above the median the captains may have misused their intelligence; captains with higher intelligence received lower performance ratings.

The Intelligence x Subordinate Stress interaction is shown in Figure 4. Here, as in the Boss Stress interaction, above the Intelligence median officers perform best when Subordinate Stress is low and have a lower performance mean when such stress is high (above

the median). This also supports the conclusion that in some conditions these captains may misuse their intelligence. The results for the Intelligence x Subordinate Stress interaction for captains support the hypothesis that stress with boss and stress with subordinates both moderate the utilization of intelligence in leadership tasks.

Discussion

Previous research has primarily investigated how stress with the immediate superior affects the use of experience and intelligence. The present findings show that stress with subordinates has similar moderating effects on the use of experience and intelligence. It further demonstrates that the mediating effects of subordinate stress add a significant amount to the variance explained by stress with the boss. Stress or conflict between group members makes it difficult to predict what subordinates will do and consequently makes supervision extremely difficult. Moreover, when interpersonal relations are uncertain, previously proven solutions to leadership problems (provided by experience) will have a higher probability of success than new or unique solutions (presumably provided by intelligence).

Under high stress lieutenants with high experience performed best, but intelligence was relatively unimportant. Just the opposite was true for captains under high stress, their level of intelligence was critical to determining performance then but experience was much less critical. What determines whether experience or intelligence is the critical factor under stress? One possible explanation is the difference in each position's duties. Lieutenants

are first level leaders, responsible only for their own crew's actions. Captains, however are second level leaders and have more complex duties which sometimes require them to coordinate the actions of several crews. The difference in the tasks first and second level leaders face may therefore play a part in determining whether their intelligence or experience is the critical resource for effective performance as a leader in a stressful situation.

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FIGURE 1

Interaction Between Boss Stress and Experience for Fire Department Lieutenants

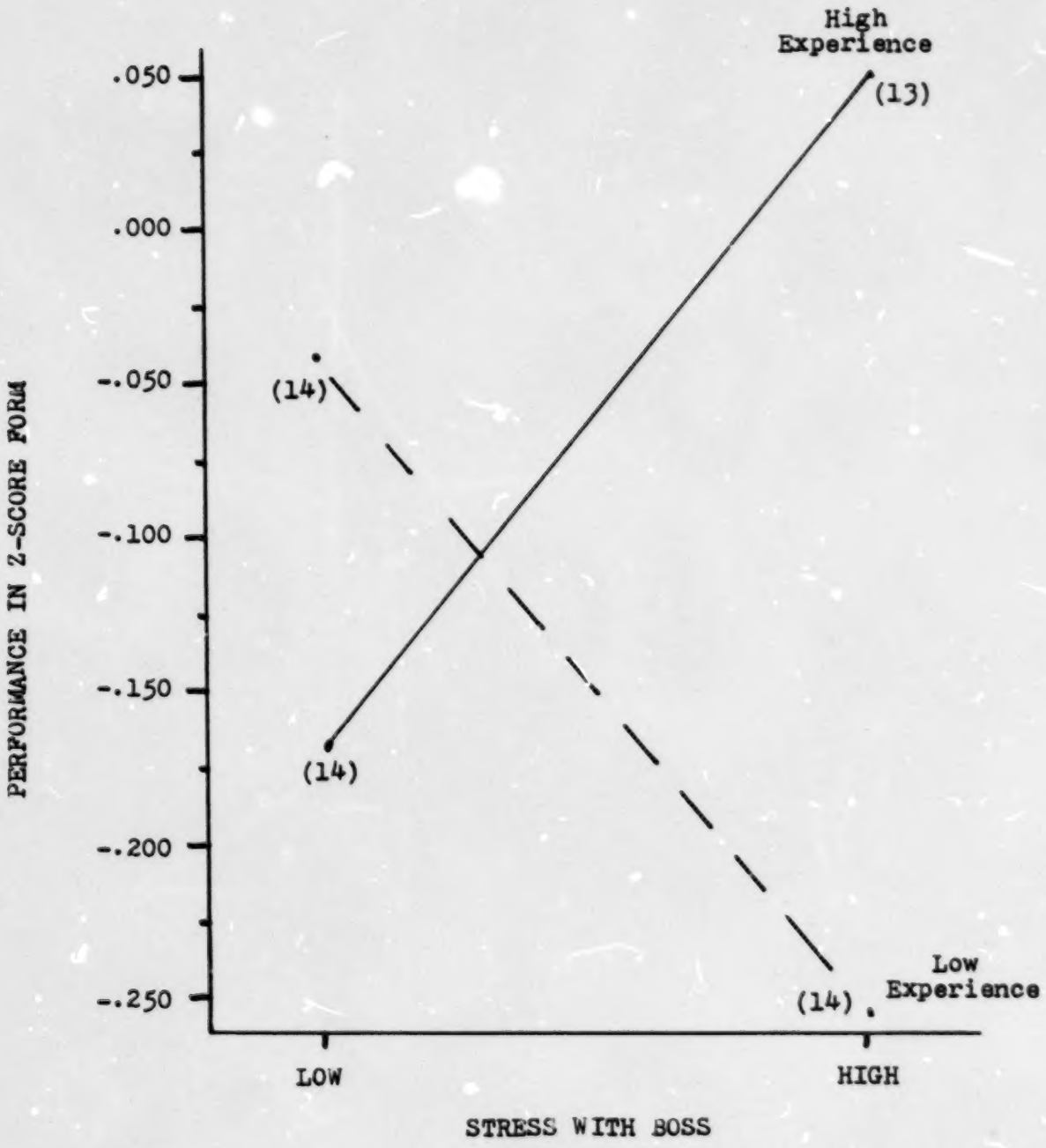

FIGURE 2

Interaction Between Subordinate Stress and Experience for Fire Department Lieutenants

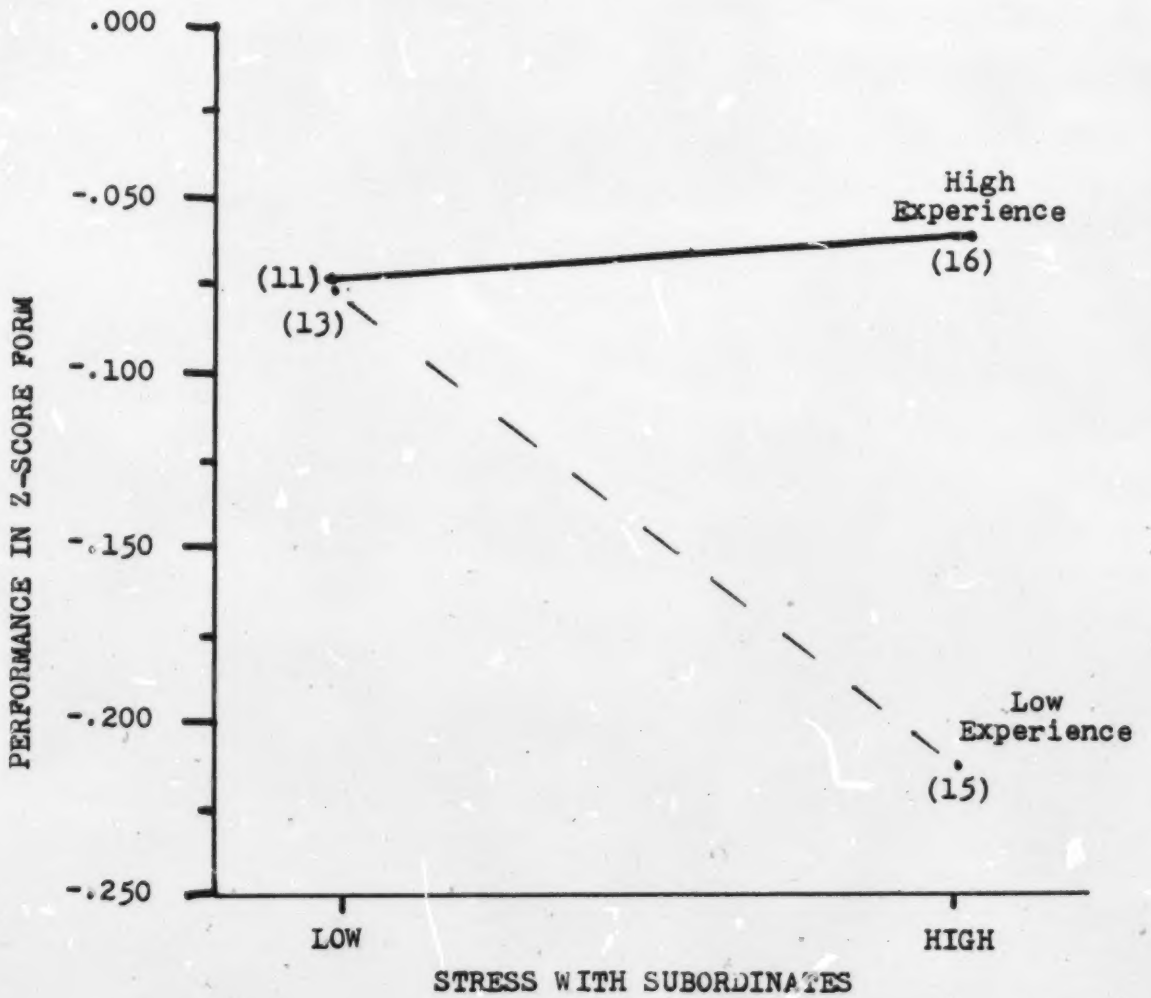

FIGURE 3

Interaction Between Boss Stress and Intelligence for Fire Department Captains

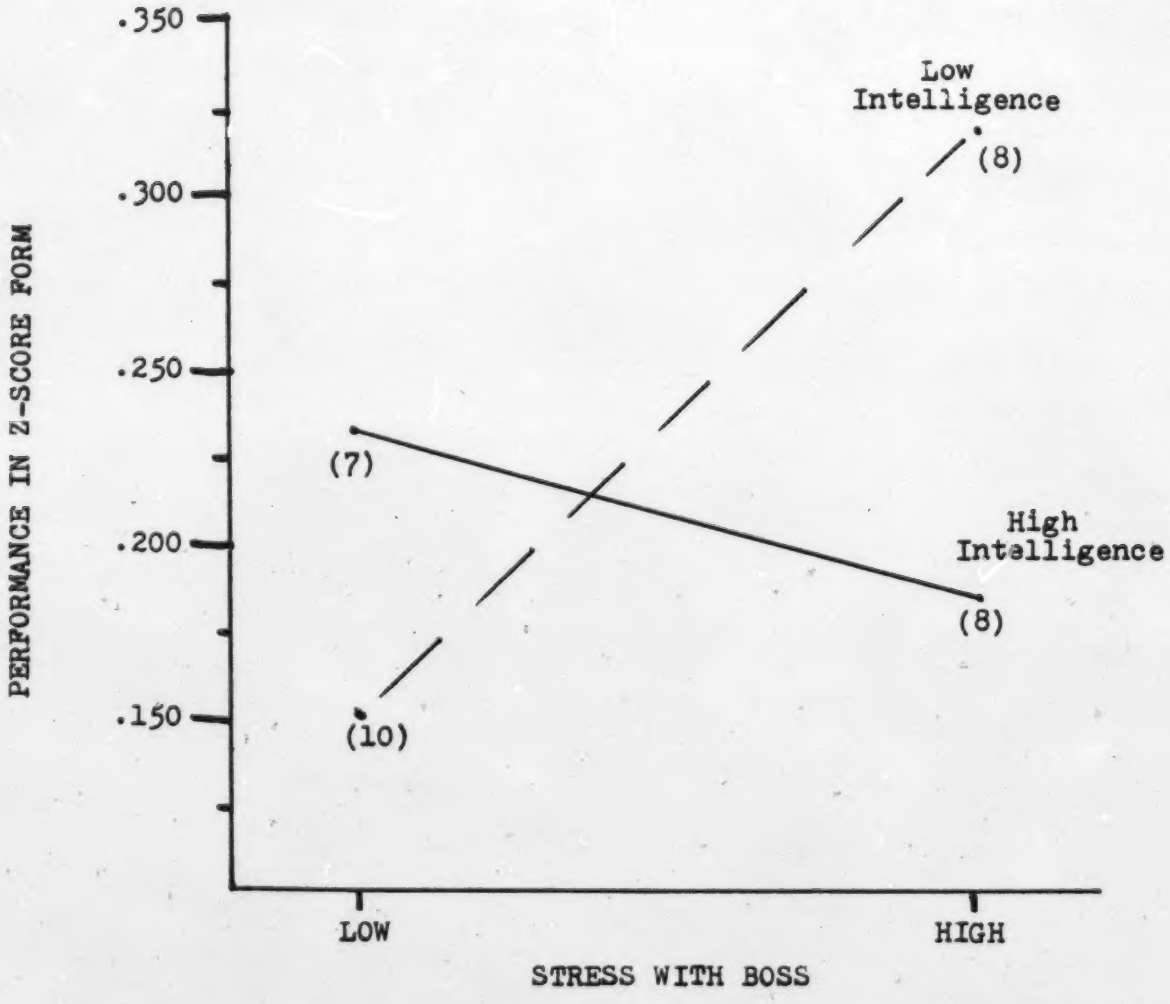

FIGURE 4

Interaction Between Subordinate Stress and Intelligence for Fire Department Captains